


NWS: EHB-6, Maintenance Note 25
DoD: TO 31P1-4-108-580
FAA: EEM Modification Handbook 6345.1 CHG 15, Chap 14

**INSPECTION OF THE AZIMUTH AND ELEVATION
GEARBOX HOUSINGS FOR OIL LEAKS AND BOLT
TIGHTNESS**

**DOPPLER METEOROLOGICAL RADAR
WSR-88D**



DoD Distribution Statement A - Approved for public release; distribution is unlimited.

PUBLISHED UNDER AUTHORITY OF THE SECRETARIES OF
COMMERCE, THE AIR FORCE, THE NAVY, AND TRANSPORTATION

Data Code: 3118571
Issuance Number: EHB 6-99-11
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[illegible]

NWS APPROVAL:

//SIGNED//

_____ Date _____

John McNulty
Chief, Engineering Division

FAA APPROVAL:

//SIGNED//

_____ Date _____

Raymond M. Long
Program Director for Operational Support

DoD APPROVAL:

BY ORDER OF THE SECRETARY OF THE AIR FORCE

MICHAEL E. RYAN, General, USAF
Chief of Staff

//SIGNED//

_____ Date _____

Edward L. Berkowitz, Chief
System Support Branch
Operational Support Facility
TOMA

1. SUBJECT

Inspection of the Azimuth and Elevation Gearbox Housings for oil leaks and bolt tightness.

2. PURPOSE

The purpose of this URGENT document is to inspect the Azimuth (UD2A1A3A3) and Elevation (UD2A1A1A3) Gearbox Housings for oil leaks and bolt tightness. Due to recent failures of the azimuth gearbox assemblies, the Operational Support Facility (OSF) is requesting each site check the azimuth and elevation gearbox assemblies for leaks and to verify the housing bolts are torqued to the correct specifications.

NOTE: This change has been reviewed and evaluated for impact upon year 2000 (Y2K) functionality and has no detrimental effect upon Y2K compliance issues.

For additional information concerning this document, contact the OSF Hotline, Norman, Oklahoma; phone number: (800) 643-3363 or (405) 366-2980 or by e-mail at Hotline@osf.noaa.gov. An electronic copy of this document can be found at the following internet address: www.osf.noaa.gov/ssb/sysdoc/techman/tmlinks.htm

3. SITES AFFECTED

This document applies to all NWS, DoD, and FAA Radar Data Acquisition (RDA) sites.

4. ESTIMATED COMPLETION DATE

Immediately upon receipt of this document.

5. EQUIPMENT AFFECTED

Radar Data Acquisition Group.

6. SPARES AFFECTED

Not applicable.

7. MODIFICATION ACCOMPLISHED BY

Site Electronics Technicians will perform this task. Two technicians are required to perform the attached procedures.

8. MATERIAL REQUIRED

Not applicable.

9. SOURCE OF MATERIALS

Not applicable.

10. SPECIAL TOOLS AND TEST EQUIPMENT REQUIRED

Not applicable.

11. TIME AND PERSONNEL REQUIRED

Work Phases	AFSC Skills	Work-Hours
Unpacking	2E051	0.0
Disassembly	2E051	0.0
Installation	2E051	0.0
Assembly	2E051	0.0
Operational Check	2E051	1.00
Total Work-Hours		1.00

12. DOCUMENTS AFFECTED

Not applicable.

13. VERIFICATION STATEMENT

These procedures were successfully performed at OSF.

14. DISPOSITION OF REMOVED AND REPLACED PARTS/MATERIALS

Not applicable.

15. PROCEDURES

See [ATTACHMENT 1](#).

16. FAA DISTRIBUTION

This directive is distributed to selected offices and services within Washington headquarters, the William J. Hughes Technical Center, the Mike Monroney Aeronautical Center, regional Airway Facilities divisions, and Airway Facilities field offices having the following facilities/equipment: NXRAD.

17. CHANGES TO TABLE OF CONTENTS (FAA)

This chapter will be included in the next revision to the table of contents for FAA Order 6345.1, Electronic Equipment Modification Handbook - Next Generation Weather Radar (NEXRAD).

18. RECOMMENDATIONS FOR CHANGES (FAA)

Forward any recommendations for changes to this directive through normal channels to the National Airway Systems Engineering Division, AOS-200, Operational Support.

19. REPORTING INSTRUCTIONS

a. NWS

Report completed task on WS Form A-26, Engineering Management Reporting System Maintenance Record, according to instructions in EHB-4, Part 2, using reporting code RDA. Also, record the modification number in block 17(a) as M25. (See ATTACHMENT 3 for a completed sample of WS Form A-26.)

b. DoD

Update the AFTO Form 95 to show TCTO compliance. Report TCTO compliance in accordance with TO 00-20-2, Table 3-10, Rule 9.

c. FAA (Changes to Recorded Data)

Enter this document number, date, and chapter number in the appropriate FAA Form 6032-1, Airway Facilities Modification Record.

d. All Agencies

Complete [ATTACHMENT 2](#) and fax, mail, or e-mail information to:

- (1) Mail Address: System Support Branch, Logistics Section
 Operational Support Facility
 3200 Marshall Ave., Suite 101
 Norman, Oklahoma 73072-8028

- (2) Fax Number: (405) 366-6553
 ATTN: Logistics Section

- (3) E-mail Address: Logistics@osf.noaa.gov

ATTACHMENT 1

INSPECTION OF ELEVATION AND AZIMUTH GEARBOX ASSEMBLIES

TOOLS REQUIRED:

1/2-inch, six-point socket, 3/8-inch drive
Torque wrench, foot-pounds or inch-pounds

1. At the Unit Control Position (UCP) Applications Terminal, enable local control of the Radar Data Acquisition (RDA) by entering **RD,EN<Return>** at the command line of the RDA Control menu.
2. At the RDA site, perform the following shutdown procedures:

WARNING

HIGH VOLTAGE. Electrical voltage, power on. Ensure the Radar Transmitter is powered OFF and circuit breakers on the Power Distribution Panel (UD3A13/UD103A13) are locked out. Ensure Secondary Power Distribution Panel (UD7A3, UD7A29, or UD7A30) CB2, CB4, and CB6 Pedestal Motor Power is switched OFF. Ensure RDA Maintenance Panel Assembly (UD5A2) PEDESTAL ELECTRONICS POWER switch is OFF. Electrical voltages may cause severe shock or death on contact.

- a. At the RDA Man Machine Interface (MMI) main menu, enter **RELC<Return>** to request local control of the RDA, if not already done.
- b. Enter **STBY<Return>** at the RDA MMI command line. **NWS and FAA redundant systems:** Ensure both channels are placed in standby.
- c. Power **OFF** the Radar Transmitter by switching the three circuit breakers on the Transmitter Power Distribution Panel (UD3A13/UD103A13, CB1, CB2 and CB3) to the **OFF** position. **NWS and FAA redundant systems:** Ensure both channels are powered **OFF**.
- d. On the RDA Maintenance Panel assembly (UD5A2), turn the PEDESTAL ELECTRONICS POWER switch to the **OFF** position and install an approved lockout/tagout device to the PEDESTAL ELECTONICS POWER switch.
- e. On the Secondary Power Distribution Panel (UD7A3), switch **OFF** CB2, CB4, and CB6 PEDESTAL MOTOR POWER. **NWS and FAA redundant systems:** Switch **OFF** CB2, CB4, and CB6 in the Secondary Power Panels UD7A30 or UD7A29.

ATTACHMENT 1 (Continued)

INSPECTION OF ELEVATION AND AZIMUTH GEARBOX ASSEMBLIES

3. Inspect the Elevation (UD2A1A1A3) and Azimuth (UD2A1A3A3) Gearbox Housings by performing the following steps:

WARNING

ELEVATED WORK PLATFORM. Use all handrails, safety chains, safety belts/harnesses, safety rails, and ladders properly while servicing the antenna pedestal. Severe injury or death may occur from impacting the surface below.

- a. On the Azimuth Riser (UD2A1), set the SAFE/OPERATE switch to **SAFE**.

WARNING

ROTATING EQUIPMENT. Ensure the azimuth stow mechanism is engaged in the **STOW** position. Ensure both left and right elevation stow mechanisms are engaged when stowing the antenna. Failure to **STOW** antenna may cause injury or death.

- b. Move the antenna in azimuth until the azimuth stow mechanism is within close proximity to the proper azimuth stow position. Place the Pedestal extension ladder on the Elevation Housing **lower** ladder support bar. While one technician moves the antenna, stow the antenna in the azimuth stow position.
- c. While one technician moves the antenna, stow the antenna in the 0° elevation position (first stow pin position). Ensure both left and right stow mechanisms are engaged.
- d. Open the Elevation Access Door.
- e. Climb into the Elevation Housing and locate the Elevation Gearbox assembly.
- f. Visually check the Elevation Gearbox assembly for any oil leaks and if oil is present in the oil collection bottle (if applicable). If a leak is detected, or if oil is found in the collection bottle, annotate it on [ATTACHMENT 2](#) and notify the OSF Hotline at (800) 643-3363, or (405) 366-2980, or by e-mail at Hotline@osf.noaa.gov.
- g. Retorque all eight (8) gearbox housing bolts to 14 foot-pounds or 168 inch-pounds. If any of the eight (8) bolts were loose, annotate the result on [ATTACHMENT 2](#) and notify the OSF Hotline at (800) 643-3363, or (405) 366-2980, or by e-mail at Hotline@osf.noaa.gov. (See [Figure 1.](#))
- h. Using [Figure 3](#) as a guide, count the number of petcock valves and annotate the number on [ATTACHMENT 2](#).

ATTACHMENT 1 (Continued)

INSPECTION OF ELEVATION AND AZIMUTH GEARBOX ASSEMBLIES

- i. Climb out of the Elevation Housing and close the Elevation Access Door.
- j. Open and remove the Azimuth Access Door and set aside.
- k. Climb into the Azimuth Housing and locate the Azimuth Gearbox assembly.
- l. Visually check the Azimuth Gearbox assembly for any oil leaks and if oil is present in the oil collection bottle. If a leak is detected, or if oil is found in the collection bottle, annotate it on [ATTACHMENT 2](#) and notify the OSF Hotline at (800) 643-3363, or (405) 366-2980, or by e-mail at Hotline@osf.noaa.gov.
- m. Retorque all eight (8) gearbox housing bolts to 14 foot-pounds or 168 inch-pounds. If any of the eight (8) bolts were loose, annotate the result on [ATTACHMENT 2](#) and notify the OSF Hotline at (800) 643-3363, or (405) 366-2980, or by e-mail at Hotline@osf.noaa.gov. (See [Figure 1.](#))
- n. Using [Figure 2](#), Section B-B as a guide, count the number of petcock valves and annotate the number on [ATTACHMENT 2](#).
- o. Climb out of the Azimuth Housing.
- p. Reinstall the Azimuth Access Door.
- q. Disengage and secure the azimuth and elevation stow mechanisms.
- r. Remove the ladder from the Elevation Assembly Handrail and store in a safe place.
- s. On the Azimuth Riser (UD2A1), set the SAFE/OPERATE switch to **OPERATE**.
- t. On the Secondary Power Distribution Panel (UD7A3), switch **ON** CB2, CB4, and CB6 PEDESTAL MOTOR POWER. **NWS and FAA redundant systems:** Switch **ON** CB2, CB4, and CB6 in Secondary Power Panels UD7A30 or UD7A29.
- u. On the RDA Maintenance Panel Assembly (UD5A2), remove the approved lockout/tagout device and turn the PEDESTAL ELECTRONICS POWER switch to the **ON** position.
- v. Power **ON** the Radar Transmitter(s) by unlocking and switching **ON** the three circuit breakers on the Transmitter Power Distribution Panel (UD3A13/UD103A13). **NWS and FAA redundant systems:** Ensure both channels are powered **ON**.
- w. After the AVAIL light illuminates on the Transmitter Control Panel (UD3A1), enter **ARCH<Return>** at the RDA MMI command line.
- x. At the RDA MMI command line enter **OPER<Return>**.

ATTACHMENT 1 (Continued)

INSPECTION OF ELEVATION AND AZIMUTH GEARBOX ASSEMBLIES

- y. At the RDA MMI main menu, return control of the RDA site to the Weather Forecast Office or Weather Station.

ATTACHMENT 1 (Continued)

INSPECTION OF ELEVATION AND AZIMUTH GEARBOX ASSEMBLIES

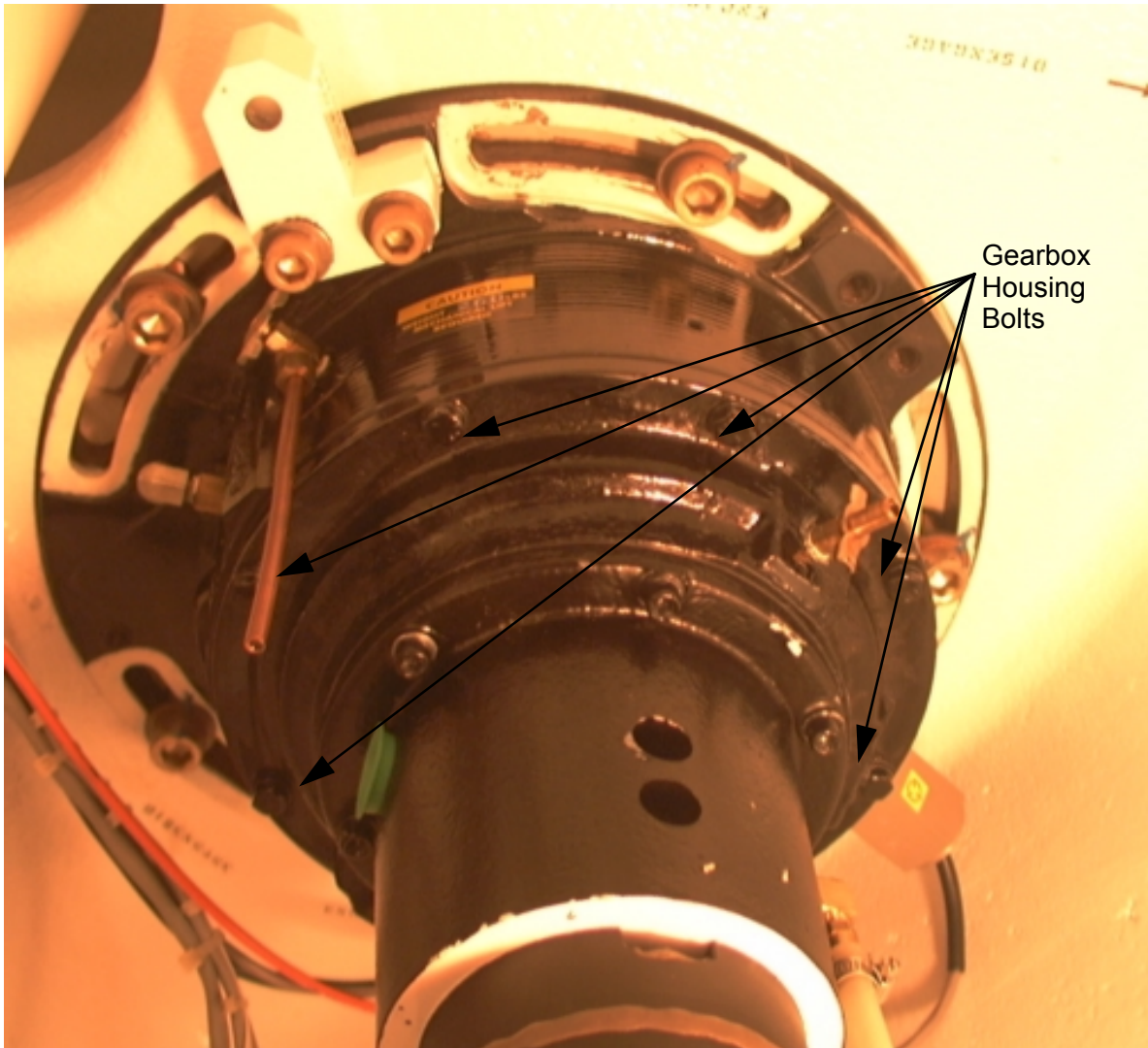


Figure 1. Gearbox Housing Bolt Assembly

ATTACHMENT 1 (Continued)

INSPECTION OF ELEVATION AND AZIMUTH GEARBOX ASSEMBLIES

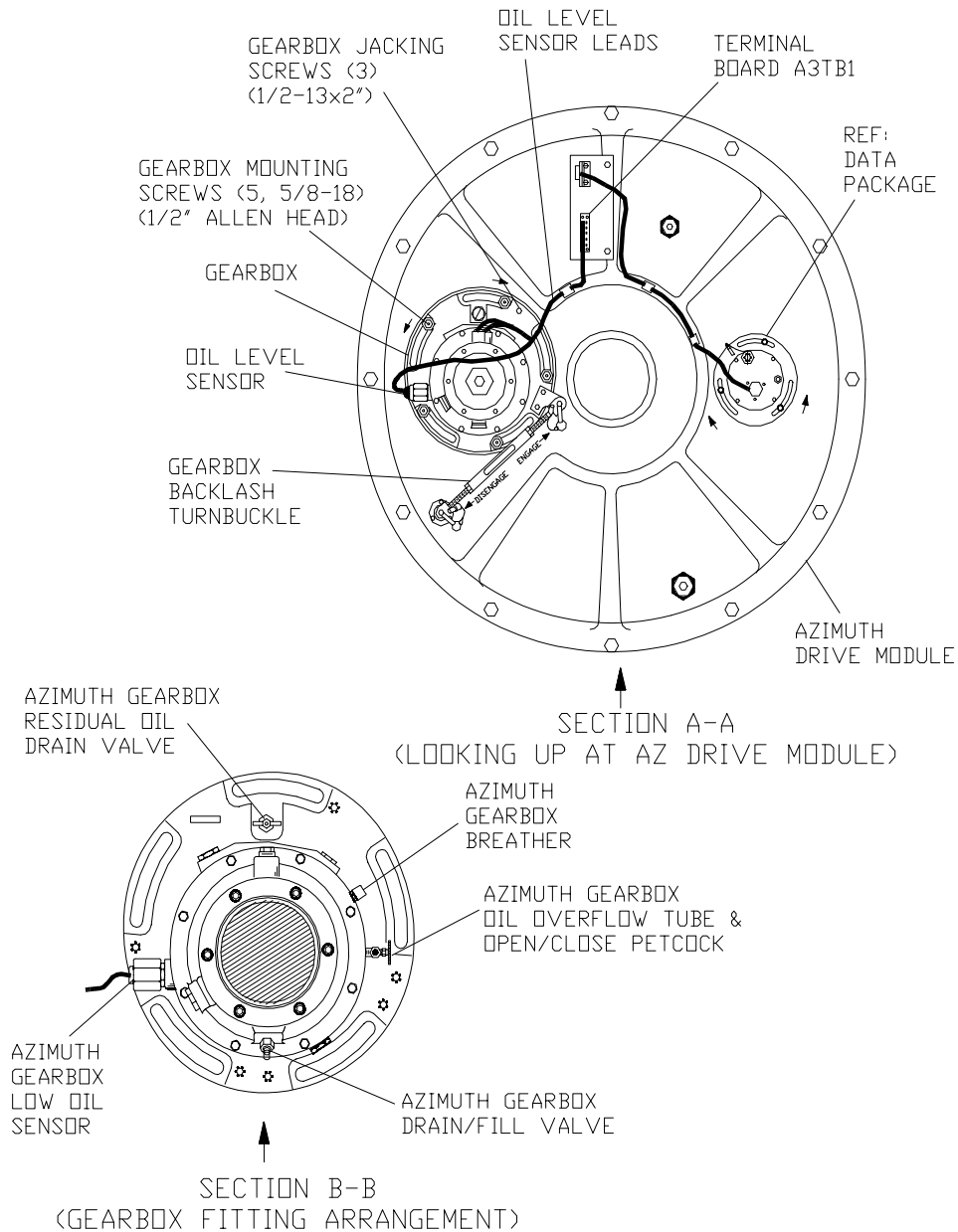


Figure 2. Azimuth Gearbox Petcock Valve Locations

ATTACHMENT 1 (Continued)

INSPECTION OF ELEVATION AND AZIMUTH GEARBOX ASSEMBLIES

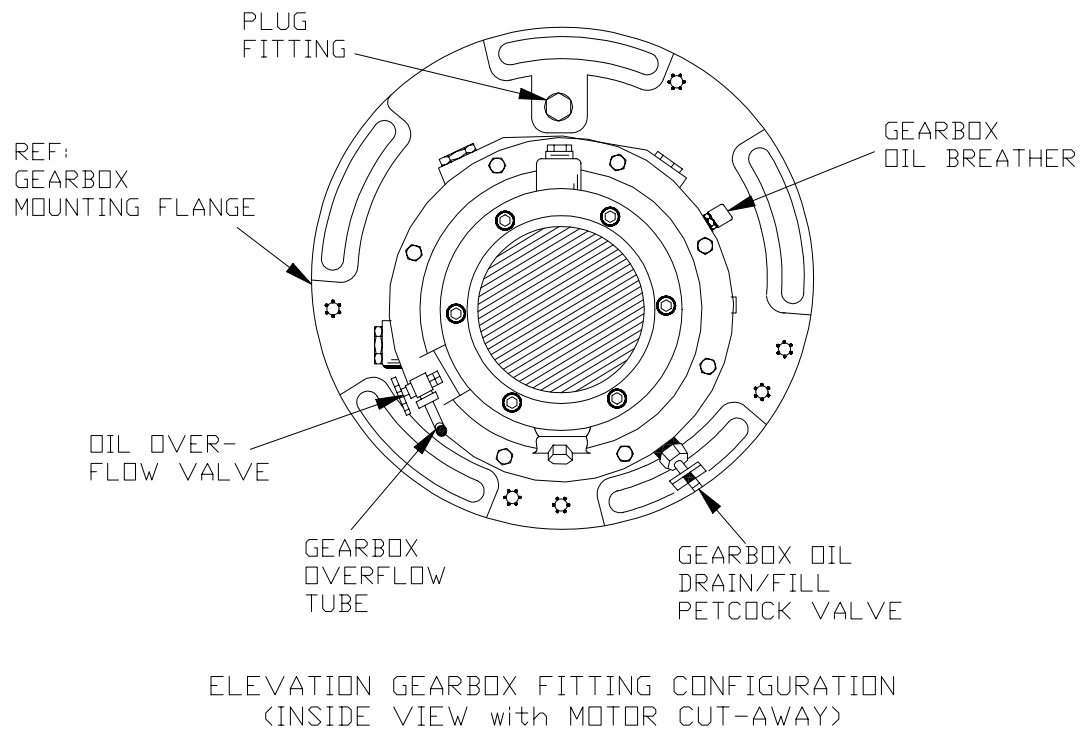


Figure 3. Elevation Gearbox Petcock Valve Location

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ATTACHMENT 2

ELEVATION AND AZIMUTH GEARBOX INSPECTION RETURN FORM

Site Name: _____

Site Identifier: _____

Total Time to complete this Maintenance Note/TCTO/EEM: _____

Technician's Name(s): _____

Technician's Phone Number: _____

Oil Leaks Found:	Azimuth	Elevation
	Yes: _____ No: _____	Yes: _____ No: _____

Oil in Collection Bottle:	Azimuth	Elevation (if equipped)
	Yes: _____ No: _____	Yes: _____ No: _____ NA: _____

Gearbox Housing Bolts Loose:	Azimuth	Elevation
	Yes: ____ No: ____ # Found ____	Yes: ____ No: ____ # Found ____

Number of Petcocks:	Azimuth	Elevation
	Quantity: _____	Quantity: _____

Date Completed: _____

Problem(s) Encountered: _____

Upon completion of this form, mail, fax, or e-mail this information to the OSF:

1. Mailing Address: System Support Branch, Logistics Section
 WSR-88D Operational Support Facility
 3200 Marshall Ave., Suite 101
 Norman, OK 73072-8028
2. FAX Number: (405) 366-6553,
 ATTN: Logistics Section
3. E-mail Address: Logistics@osf.noaa.gov